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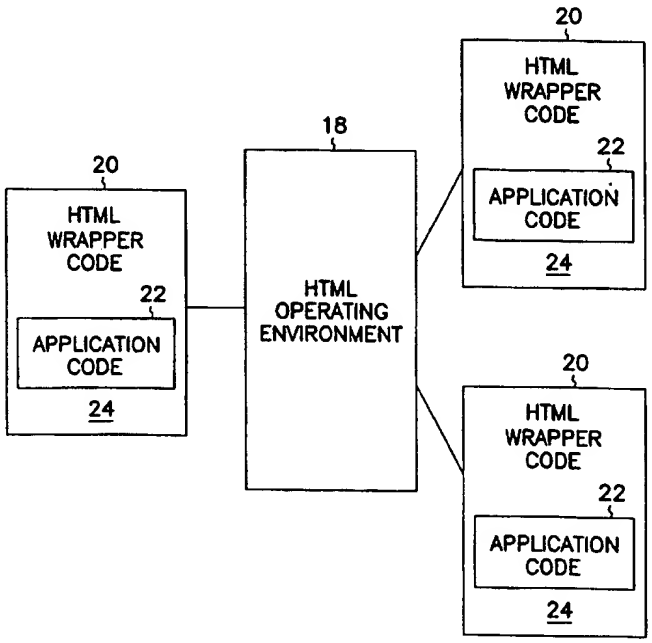
(54) Title: HYPERTEXT-MARKUP-LANGUAGE (HTML)-WRAPPED APPLICATIONS

(57) Abstract

Hypertext-markup-language (HTML)-wrapped applications are disclosed. In one embodiment, a computerized system includes one or more applications that are each embedded in a hypertext-markup-language (HTML) wrapper such that each application is able to run within an HTML operating environment. Each application thus runs dependently to the HTML operating environment. This provides for smooth integration of applications such as virtual appliance applications into an HTML operating environment.



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# HYPERTEXT-MARKUP-LANGUAGE (HTML)-WRAPPED APPLICATIONS

## FIELD OF THE INVENTION

This invention relates generally to a hypertext-markup-language (HTML) operating environment, and more specifically to applications embedded in HTML wrappers so that they are able to run within such an environment.

## BACKGROUND OF THE INVENTION

The use of hypertext-markup-language (HTML) operating environments, such as Netscape Navigator, available from Netscape Communications Corp., of Mountain View, Calif., and Microsoft Internet Explorer, available from Microsoft Corp., of Redmond, Wash., have become increasingly used with computers such as personal computers running the Microsoft Windows operating system. Initially, such HTML operating environments were used primarily only to access the Internet -- for example, to view world-wide-web (WWW) pages written in HTML.

However, HTML operating environments have been suggested as an alternative to the de facto operating environment on the computer on which it is being run. For example, rather than using the desktop normally afforded by Microsoft Windows, an HTML operating environment would instead be used as a "web top." In Microsoft Windows 97, for instance, files of data that reside on storage devices such as local hard drives, networked hard drives, etc., may be browsed using an integrated Internet Explorer application, which may also be used to view WWW pages. Netscape Communicator provides similar capability.

However, the main drawback to using such HTML operating environments as the primary working environment in lieu of a desk top is that applications, such as word processing applications like Microsoft Word and virtual appliance applications such as telephony applications that permit a computer to mimic a real-world device such as a telephone, are dependent and relate to the desk top operating environment, not the web top operating environment, even if they are started within the web top operating environment. For example, an application's viewing area cannot be integrated into the window

of and controlled by the HTML operating environment. Rather, the application's viewing area is typically a separate window, completely independent of the HTML operating environment in that the HTML operating environment cannot resize, move, or otherwise alter the window.

The closest prior art attempt to solve this problem is the "plug-in," but it falls short of actually overcoming these difficulties. Plug-ins are extensions to web browsers such as Netscape Navigator and Microsoft Internet Explorer that add functionality to and/or extend the range of data types that can be used with the web browsers. Plug-ins are specifically described in Using HTML 3.2, Java 1.1 and CGI (Platinum Edition), authored by Eric Ladd and Jim O'Donnell (Que Corporation: 1996), which is hereby incorporated by reference. However, plug-ins only extend the browser; they do not operate as separate applications within the HTML operating environment. They become part of the browser. Therefore, plug-ins do not permit applications to relate to and depend on the HTML operating environment.

This lack of control of the HTML operating environment over the viewing area of applications may slow the acceptance of such environments as viable alternatives to the desktop as operating environments. Therefore, there is a need to afford HTML operating environments such as web browsers more control over applications.

## SUMMARY OF THE INVENTION

The above-identified shortcomings as well as other shortcomings are addressed by the present invention, which will be understood by reading and studying the following specification. The invention describes a computerized system in which one or more applications are each embedded in a hypertext-markup-language (HTML) wrapper such that each application is able to run within an HTML operating environment. Each such application thus runs dependently to the HTML operating environment.

For example, this permits the HTML operating environment to control the applications desirably in at least two different ways. First, the HTML operating environment may format the visual display of an application as part of its own primary window. The primary window for the HTML operating environment is typically its browser window. Thus, the application becomes a

part of the browser window. Second, the HTML operating environment may format the visual display of an application as a separate window, under the control of the HTML operating environment. Thus, the HTML operating environment may resize, move, etc., the separate window.

As another example, the invention permits a television (TV) window to be invoked as part of an HTML window, either by user control, or by HTML control. Thus, a sports channel site such as ESPN is aware of this capability, and while the user is surfing the site, the site may open a HTML television window, and change the television station to the sports channel. Also, a computer support site, such as a Gateway 2000 support site, may also be aware of this capability, and while the user is surfing the site, the site may open an telephone telephone window, and call customer support for the user.

Therefore, wrapping an application in an HTML wrapper as afforded by the invention renders HTML operating environments as more viable alternatives to standard desktop operating environments. In different embodiments of the invention, computers, computerized systems, applications, and computer-readable media of varying scope are described. Still other and further embodiments, aspects and advantages of the invention will become apparent by reference to the drawings and by reading the following detailed description.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of a typical computer in conjunction with which embodiments of the invention may be implemented;

FIG. 2 is a block diagram showing the relationship between a hypertext-markup-language (HTML) operating environment and applications having HTML wrappers, according to an embodiment of the invention;

FIG. 3 is a diagram showing an application having an HTML wrapper formatted as part of the primary window of an HTML operating environment, according to an embodiment of the invention;

FIG. 4 is a diagram showing an application having an HTML wrapper formatted as a window separate to the primary window of an HTML operating environment, according to an embodiment of the invention; and,

FIG. 5 is a diagram showing applications having HTML wrappers formatted as both part of the primary window of an HTML operating window,

and as windows separate to the primary window, according to an embodiment of the invention.

## DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the inventions may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical and electrical changes may be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

Referring first to FIG. 1, a diagram of a typical computer in conjunction with which embodiments of the invention may be implemented is shown. Computer 10 is coupled to monitor 12, pointing device 14, and keyboard 16. Computer 10 includes a processor (preferably, an Intel Pentium processor), random-access memory (RAM) (preferably, at least thirty-two megabytes), read-only memory (ROM), and one or more storage devices, such as a hard disk drive, a floppy disk drive (into which a floppy disk can be inserted), an optical disk drive, and a tape cartridge drive. The memory, hard drives, floppy disks, etc., are types of computer-readable media. The invention is not particularly limited to any type of computer 10. Computer 10 preferably is a PC-compatible computer running a version of the Microsoft Windows operating system. The construction and operation of such computers are well known within the art.

Computer 10 may be communicatively connected to the Internet, any particular manner by which the invention is not limited to, and which is not shown in FIG. 1. Internet connectivity is well known within the art. In one embodiment, the computer includes a modem and corresponding communication drivers to connect to the Internet via what is known in the art as a "dial-up connection." In another embodiment, the computer includes an Ethernet or similar hardware card to connect to a local-area network (LAN) that itself is connected to the Internet via what is known in the art as a "direct connection"

(e.g., T1 line, etc.).

Computer 10 also has at least one hypertext-markup-language (HTML) operating environment running thereon, which may utilize the Internet connectivity. Such operating environments are typically software and preferably include at least one of Netscape Navigator and Microsoft Internet Explorer, both of which provide an HTML operating environment, and also access to the Internet's world wide web (WWW), Usenet newsgroups, and electronic mail features. The invention is not limited to any particular HTML operating environment, however, and the construction and use of such operating environments are well known within the art.

Monitor 12 permits the display of information for viewing by a user of the computer. The invention is not limited to any particular monitor 12. Such monitors include cathode ray tube (CRT) displays, as well as flat panel displays such as liquid crystal displays (LCD's). Pointing device 14 permits the control of the screen pointer provided by the graphical user interface of operating systems such as versions of Microsoft Windows. The invention is not limited to any particular pointing device 14. Such pointing devices include mouses, touch pads, trackballs, and point sticks. In one embodiment, computer 10 is a Gateway 2000, Inc., desktop personal computer, monitor 12 includes a super-VGA CRT display, and pointing device 14 is a mouse. Finally, keyboard 16 permits entry of textual information into computer 10, as known within the art, and the invention is not limited to any particular type of keyboard.

Referring now to FIG. 2, a block diagram illustrating the relationship between a hypertext-markup-language (HTML) operating environment and applications having HTML wrappers, according to an embodiment of the invention, is shown. HTML operating environment and all of applications 20 are software residing within a computer-readable medium and comprising computer-executable instructions (i.e., executable by a processor of a computer) running on a computer such as that which has been described in conjunction with FIG. 1. HTML operating environment 18 may be any type of environment running an application that permits the display of HTML-formatted content. HTML primarily provides formatting instructions for presenting text-based content in a common manner, such that any HTML-capable operating environment or viewer

may permit viewing of an HTML file. Commonly available HTML operating environments include Microsoft Internet Explorer, Microsoft Active Desktop, Netscape Netcaster and Netscape Navigator, as have been described.

Each of applications 20 includes application code 22 embedded within HTML wrapper code 24. HTML wrapper code 24 is the manner by which application code 22 interacts with HTML operating environment 18, such that each application 20 is able to run within HTML operating environment 18. Each application 20 runs dependently to HTML operating environment 18. HTML operating environment 18, either under its own control or in response to user control, may close the applications, resize or move their viewing areas, etc. In other words, each application 20 is dependent to HTML operating environment 18 in the same manner in which applications in the prior art are dependent to a desk top operating environment as found in operating systems such as versions of Microsoft Windows.

Application code 22 is the code that provides for the functionality of an application 20. Application code 22 is conceptualized as the "core" of application 20 because it cannot provide output to the display device of a computer except via HTML wrapper code 24. Therefore, HTML wrapper code 24 is conceptualized as wrapping application code 22, in that application code 22 is embedded therein so that HTML wrapper code 24 provides the manner by which application code 22 displays output on the display device of a computer, within HTML operating environment 18.

The manner by which application codes 22 are wrapped by HTML wrapper codes 24 in applications 20 is that input/output routines that are otherwise developed to utilize routines available in Microsoft Windows, may instead be developed to provide input/output in HTML format, such that the output is readable in HTML operating environment 18, and that input comes through the HTML operating environment. The providing of input/output in HTML format is performed by an application 20's HTML wrapper code 24. The construction of code to perform input/output in HTML format is known within the art. For example, the reference Using HTML 3.2, Java 1.1, and CGI, previously incorporated by reference, provides description as to how to construct code to perform input/output in HTML format.

Therefore, it is the embedding of application code within HTML wrapper code that enables applications under embodiments of the invention to run dependently to an HTML operating environment. The HTML wrapper code renders application code that may otherwise utilize input/output features available in a given operating system to instead utilize HTML. By utilizing HTML, the application is able to be controlled by the HTML operating environment. Applications thus are better integrated into the HTML operating environment, rendering HTML operating environments as more viable alternatives to the desk top operating environment.

The invention is not limited to how applications having HTML wrappers are controllable in an HTML operating environment. The HTML operating environment can be made aware of the presence of such applications, and thus make appropriate accommodations for them in the viewing area. The applications can also be invoked by the HTML operating environment itself, without the user having to perform the operation him or herself.

Exemplary control of an application having an HTML wrapper by an HTML operating environment is illustrated by reference to FIG. 3, FIG. 4, and FIG. 5. FIG. 3 is a diagram showing an application having an HTML wrapper formatted as part of the primary window of an HTML operating environment, according to an embodiment of the invention. Window 26 is the primary window in which the HTML operating environment runs within an operating system. For example, window 26 may be the "application window," as that term is known within the art, for a browser application such as Netscape Navigator or Microsoft Internet Explorer, on the desk top provided by Microsoft Windows. Within window 26, an area 28 of the viewing space of window 26 is allocated for an application having an HTML wrapper. Thus, rather than existing as a separate window not controlled by the HTML operating environment, the application becomes a part of the HTML operating environment's viewing area, and is directly controllable by the operating environment.

In FIG. 4, a diagram showing an application having an HTML wrapper formatted as a window separate to the primary window of an HTML operating environment, according to an embodiment of the invention, is shown. Window 26 is the application window for the browser, as has been described. However,

rather than existing as an area within the viewing space of window 26, the application is instead viewable as a separate window 30 floating on top of window 26. In visual effect, this is no different than if the application were dependent to the operating system of the computer (such as Microsoft Windows), and not the HTML operating environment. However, the difference is that window 30 is controllable by the HTML operating environment -- it can be closed, moved, resized, etc., by the operating environment.

Finally, referring to FIG. 5, a diagram showing applications having HTML wrappers formatted as both part of the primary window of an HTML operating window, and as windows separate to the primary window, according to an embodiment of the invention, is shown. Window 26 is the application window for the browser application acting as the HTML operating environment, as has been described. There are two particular applications running in the HTML operating environment: a television application, and a phone application. Such applications are known as virtual appliance applications because they mimic real-world devices external to the computer on which they run. For example, the television application corresponds to a real-world television, and the phone application corresponds to a real-world telephone. The application code of such applications provide their particular real-world device functionality.

The television application runs within two windows with the HTML operating environment: floating window 32, and area 34 of the viewing area of the browser's primary window 26. As shown in FIG. 5, floating window 32 includes the video output of a television tuner coupled to the computer on which the HTML operating environment is running. Such an application is common in a convergence computing environment, in which both television and computer functionality are provided in one system. Such convergence computing environments are provided by systems like the Gateway 2000, Inc., Destination system. While floating window 32 includes the video output of the tuner, area 34 includes the controls for the tuner, such that the user is able to click on controls within area 34 to change the channel tuned to in floating window 32.

This embodiment of the invention, therefore, provides the capability of adding virtual appliances to an HTML operating environment, such as a web browser or a web top environment. This enables operation of the virtual

appliances while also using the web browser functionality of the HTML operating environment. For example, the user is desirably able to view a web page on the viewing area of window 26 not taken up by areas 34 and 38. Thus, the user is able to watch a television application while exploring the world-wide-web of the Internet. This convergence allows for related activities, such as viewing the web page of a television show while simultaneously watching the television show.

The phone application also runs within two windows with the HTML operating environment: floating window 36, and area 38 of the viewing area of the browser's primary window 26. As shown in FIG. 5, floating window 36 includes the controls of the phone functionality of a modem card coupled to the computer on which the HTML operating environment is running. Such an application is also common in a convergence computing environment. While floating window 36 includes the controls of the phone functionality, such that a user is able to dial a number, answer a ringing telephone, etc., area 38 is a single button that when clicked brings up floating window 36, which is otherwise closed.

Thus, when the user wishes to use the phone functionality of the convergence computing environment, the user clicks on the button within area 38, which brings up window 36, such that the user is able to dial a phone number, etc. Furthermore, when the phone application detects that someone is calling, it automatically opens window 36, permitting the user to easily answer the ringing phone. Therefore, while a user is browsing the Internet's world wide web, the user is easily able to utilize the phone functionality afforded by the convergence computing environment because the phone application is run dependently to the HTML operating environment. The user does not have to go to a start menu, for example, and click on the necessary application; the application itself runs dependent to the HTML operating environment, so that it can be better integrated within the environment.

Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiments shown. For example, the invention permits a

television (TV) window to be invoked as part of an HTML window, either by user control, or by HTML control. Thus, a sports channel site such as ESPN is aware of this capability, and while the user is surfing the site, the site may open a HTML television window, and change the television station to the sports channel. Also, a computer support site, such as a Gateway 2000 support site, may also be aware of this capability, and while the user is surfing the site, the site may open an telephone telephone window, and call customer support for the user. Thus, this application is intended to cover any adaptations or variations of the present invention. Therefore, it is manifestly intended that this invention be limited only by the following claims and equivalents thereof.

What is claimed is:

1. A computerized system comprising:

a hypertext-markup-language (HTML) operating environment; and,

at least one application, each application embedded in an HTML wrapper such that the application is able to run within the HTML operating environment,

wherein each application runs dependently to the HTML operating environment.

2. The computerized system of claim 1, wherein the HTML operating environment comprises a web browser application.

3. The computerized system of claim 1, wherein the HTML operating environment has a primary window, and at least one of the applications is formatted by the operating environment as part of the primary window.

4. The computerized system of claim 1, wherein the HTML operating environment has a primary window, and at least one of the applications is formatted by the operating environment in a floating window on top of the primary window.

5. The computerized system of claim 1, wherein at least one of the applications comprises a virtual appliance mimicking a device external to the computerized system.

6. The computerized system of claim 1, wherein viewing of at least one of the applications within the HTML operating environment is user controlled.

7. The computerized system of claim 1, wherein viewing of at least one of the applications within the HTML operating environment is controlled by the HTML operating environment.

8. A computer comprising:

a processor;

a computer-readable medium;

a hypertext-markup-language (HTML) operating environment executed from the computer-readable medium by the processor; and,

at least one application, each application executed from the computer-readable medium by the processor and embedded in an HTML wrapper such that the application is able to run within the HTML operating environment,

wherein each application runs dependently to the HTML operating environment.

9. The computer of claim 8, wherein the computer-readable medium comprises a memory.

10. An application comprising:

hypertext-markup-language (HTML) code so that the application is able to run dependently to and within an HTML operating environment; and,

application code embedded in the HTML code to cause a computer on which the application is running to perform a particular functionality.

11. The application of claim 10, wherein the particular functionality of the application code comprises a virtual appliance mimicking a device external to a computer on which the application is running.

12. A computer-readable medium for a computer having an executable application stored thereon comprising:

application means to cause the computer to perform a particular functionality; and,

hypertext-markup-language (HTML) wrapper means in which the application means is embedded so that the particular functionality is performed dependently to and within an HTML operating environment.

13. The computer-readable medium of claim 12, wherein the medium is a floppy disk.

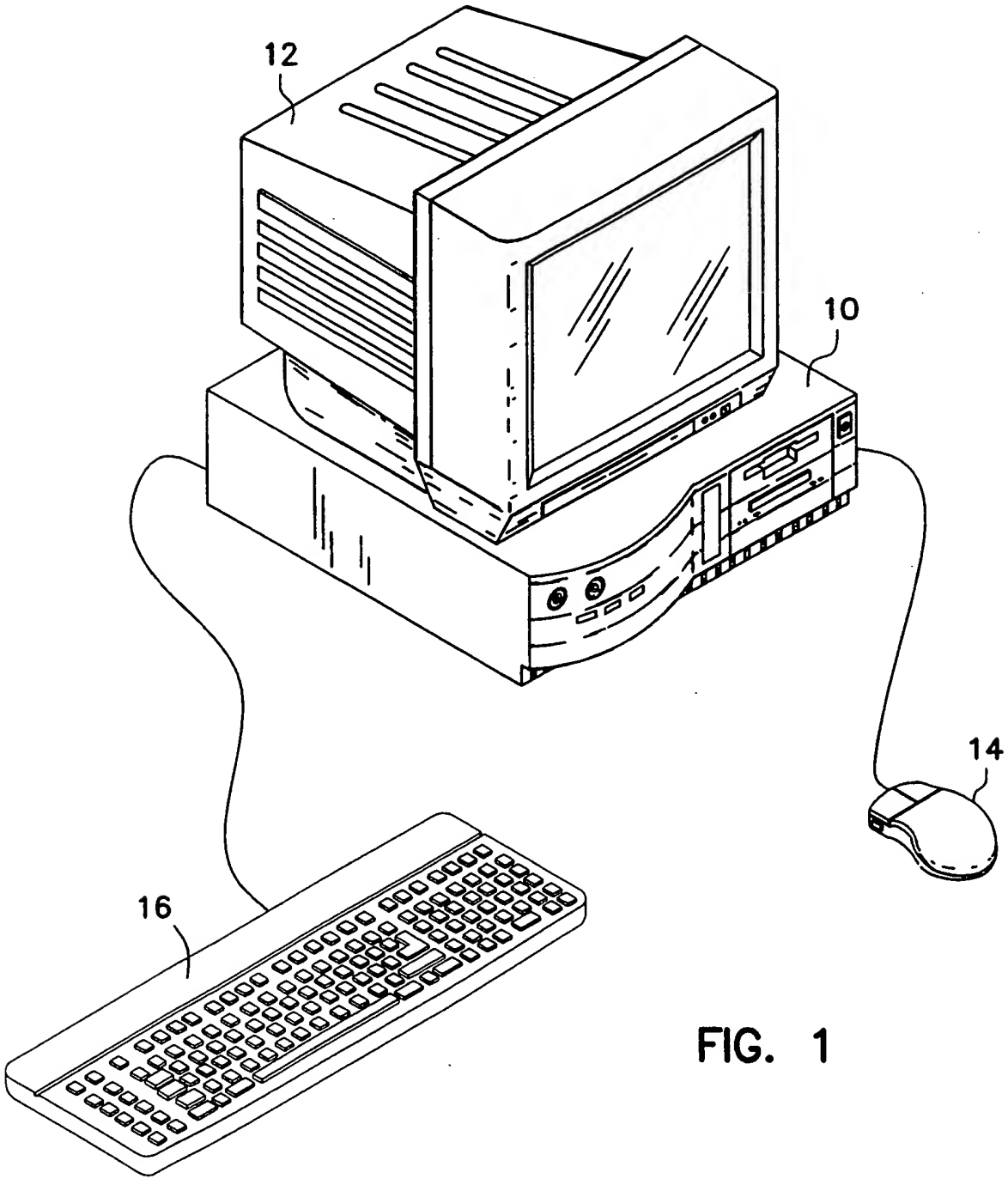
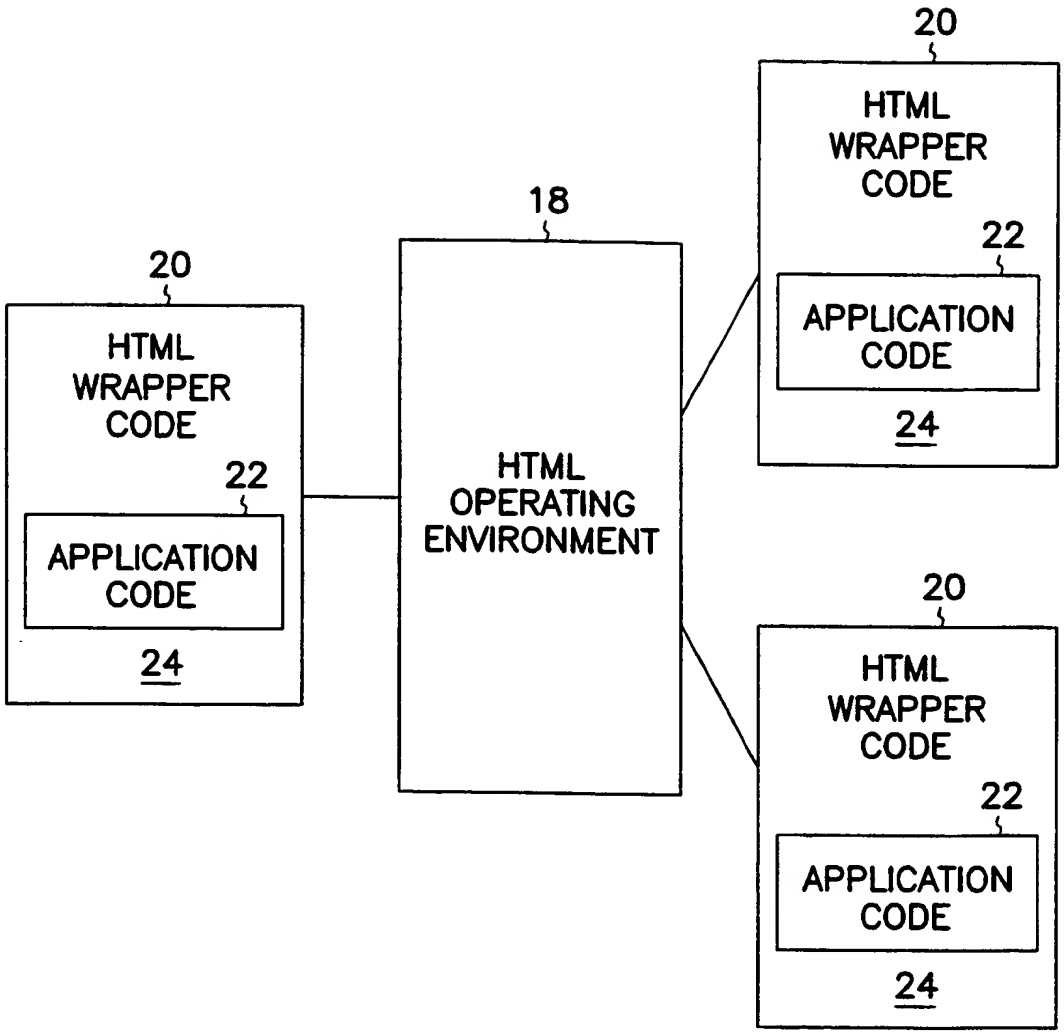



FIG. 1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HTML
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FIG. 2

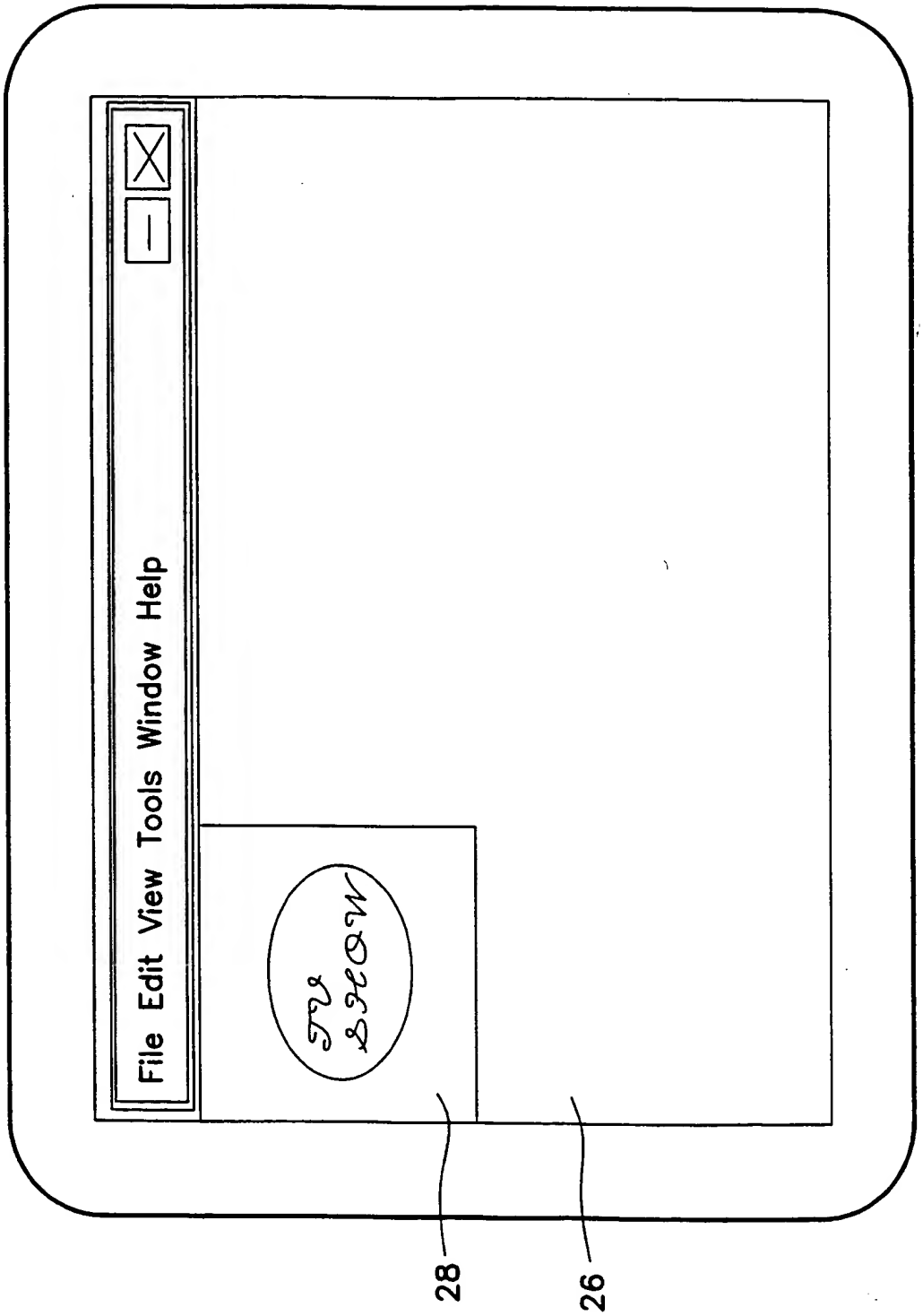


FIG. 3

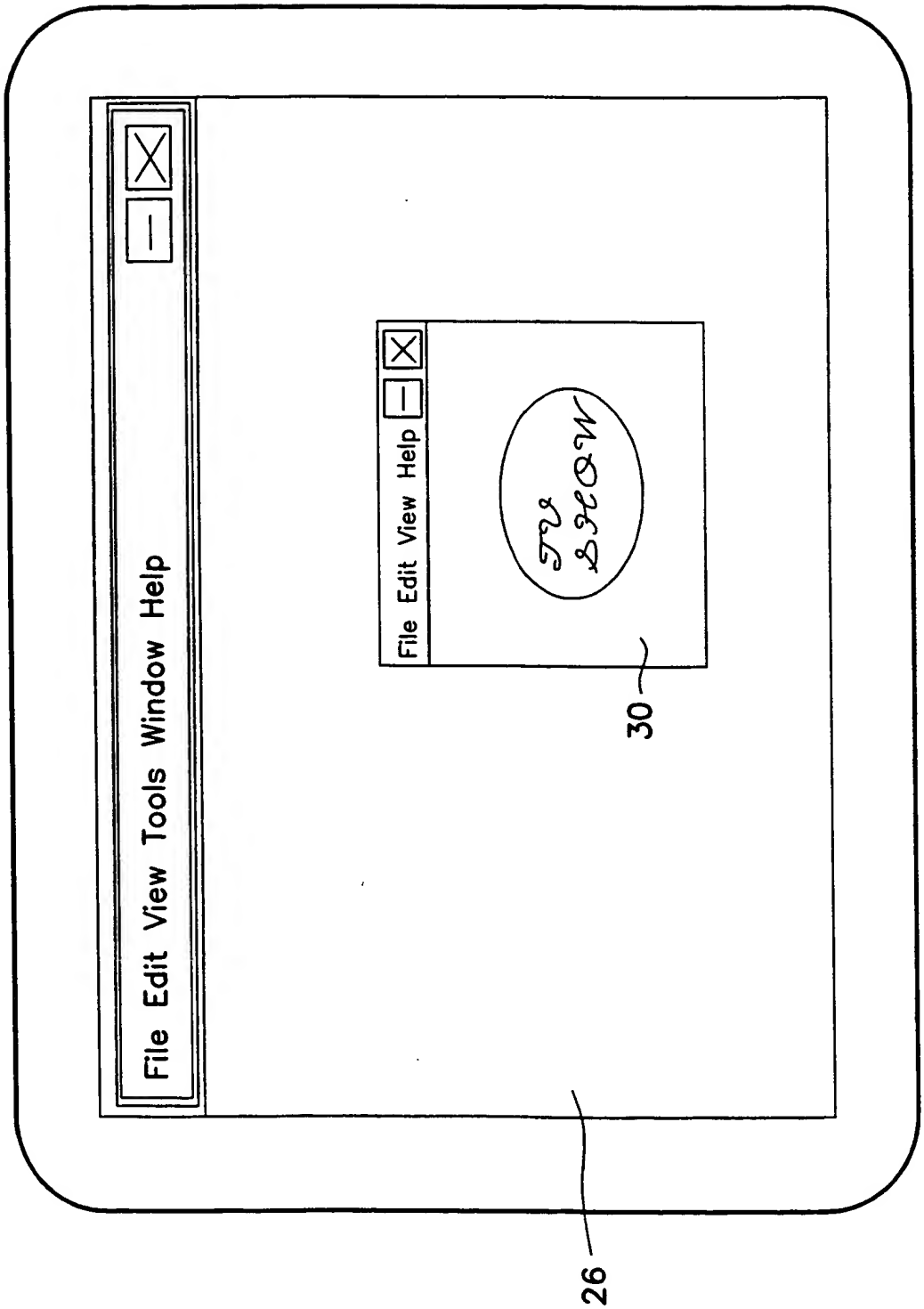


FIG. 4

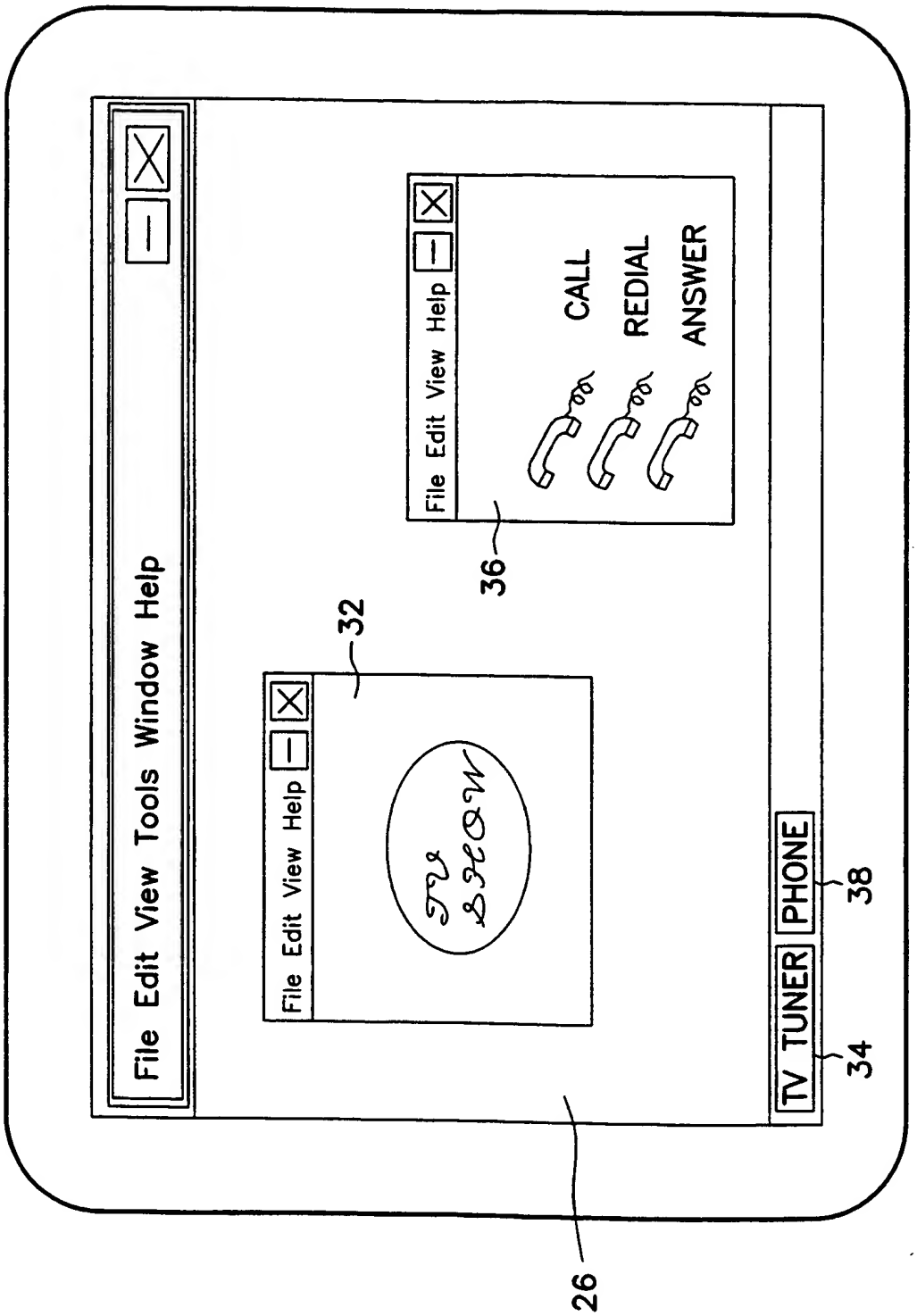
File Edit View Tools Window Help
File Edit View Help
File Edit View Help
CALL
REDIAL
ANSWER
TV TUNER
PHONE
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FIG. 5

# INTERNATIONAL SEARCH REPORT

Intern ial Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F9/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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IPC 6 G06F

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | PALEY S M ET AL: "Adapting EcoCyc for use on the World Wide Web" GENE, vol. 172, no. 1, 20 June 1996, page GC43-GC50 XP004095344 | 1,2, 8-10,12, 13 |
| Y | see page 43, left-hand column, line 1 - page 44, left-hand column, line 56 see page 46, left-hand column, line 6 - right-hand column, line 32 | 3-7,11 |
| X | PHANOURIOU C ET AL: "Transforming command-line driven systems to Web applications" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 29, no. 8-13, 1 September 1997, page 1497-1505 XP004095344 | 1,2, 8-10,12, 13 |
| Y | see page 1500, left-hand column, paragraph 3 - page 1502 | 3-7,11 |

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21 June 1999

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# INTERNATIONAL SEARCH REPORT

Intern ıal Application No
PCT/US 99/00060

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F9/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | PALEY S M ET AL: "Adapting EcoCyc for use on the World Wide Web" GENE, vol. 172, no. 1, 12 June 1996, page GC43-GC50 XP004042696 | 1,2, 8-10,12, 13 |
| Y | see page 43, left-hand column, line 1 - page 44, left-hand column, line 16 see page 46, left-hand column, line 6 - right-hand column, line 32 --- | 3-7,11 |
| X | PHANOURIOU C ET AL: "Transforming command-line driven systems to Web applications" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 29, no. 8-13, 1 September 1997, page 1497-1505 XP004095344 | 1,2, 8-10,12, 13 |
| Y | see page 1500, left-hand column, paragraph 3 - page 1502 --- | 3-7,11 |
| | -/-- | |

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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| 21 June 1999 | 28/06/1999 |

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| European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, | Rijn K |

# INTERNATIONAL SEARCH REPORT

Interr. ıal Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication,where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | EDWARDS N ET AL: "High security Web servers and gateways" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 29, no. 8-13, 1 September 1997, page 927-938 XP004095292 | 1,2, 8-10,12, 13 |
| Y | see page 930, right-hand column, line 13 - page 931, left-hand column, line 24 | 3-7,11 |
| Y | US 5 680 323 A (BARNARD JOHN D) 21 October 1997 | 3,5-7,11 |
| A | see column 1, line 17 - line 65 see column 4, line 21 - column 6, line 53 | 1,8-13 |
| Y | EP 0 694 834 A (CANON KK) 31 January 1996 | 4-7,11 |
| A | see page 2, line 28 - page 3, line 44 see page 6, line 36 - page 7, line 32 | 1,8-13 |

# INTERNATIONAL SEARCH REPORT

information on patent family members

Intern ıal Application No
PCT/US 99/00060

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5680323 A | 21-10-1997 | NONE | |
| EP 0694834 A | 31-01-1996 | US 5659694 A | 19-08-1997 |
| | | JP 8063348 A | 08-03-1996 |